REMARKS

Claims 1-43 remain pending in the application. Claims 1, 3-5, 9-11, 13-17, 19, 27, 35 and 37 are amended. Reconsideration of the rejection and allowance of the pending application in view of the following remarks are respectfully requested.

In the Final Office Action, the Examiner rejects claims 1-43 under 35 U.S.C. §112, 1st paragraph as failing to comply with the enablement requirement. Specifically, the Examiner asserts that the subject matter "the first transceiver and the second transceiver are separated by a distance greater than a maximum transmission range of at least one of the transceivers" is not described in the specification in such a way as to enable one skilled in the art to make and/or use the invention. In this regard, the Examiner asserts that it is not clear how the repeater knows whether the transceivers are separated by a distance greater than a maximum transmission range of at least one of the transceivers, and the distance corresponding to the maximum transmission range cannot be known prior to transmitting a message to the receiver.

The Examiner also rejects claims 1-43 under 35 U.S.C. §112, 2nd paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter regarded as the invention. Specifically, the Examiner asserts that the feature "the first transceiver and the second transceiver are separated by a distance greater than a maximum transmission range of at least one of the transceivers" is not clear, because it is unclear what is meant by "maximum transmission range". The Examiner asserts that the maximum transmission range could depend on several factors such as type of antenna, battery power, location of the transmitter, repeater, receiver, etc.

Applicants respectfully disagree with the rejections under 35 U.S.C. §112, 1st and 2nd paragraphs. However, in order to advance prosecution of the present application to

issue, Applicants have amended independent claims 1, 4, 14, 16, 19, 27, 35 and 37 to remove the subject matter disputed by the Examiner. Thus, these amendments should not be taken as an acquiescence by Applicants to the propriety of the rejections.

In the Final Office Action, the Examiner rejects claims 1, 4, 10, 14, 16, 19, 27, 35 and 37 under 35 U.S.C. §102(b) as being anticipated by Brederveld et al. (U.S. Patent No. 5,898,679).

Applicants' claim 1, as currently amended, recites a method for use in a radio communication system including a first transceiver and a second transceiver. The method includes, inter alia, transmitting a repeat flag to cause the transceivers to suspend further action, and then transmitting an overall status to cause the transceivers to resume further action.

Applicants' independent claim 4, as currently amended, recites a method for transmitting and receiving data according to a frame for use in a network of devices including a first transceiver, a repeater, and at least one other transceiver. The method includes, inter alia, transmitting data for each of the at least one other transceivers in a first time slot, transmitting a repeat flag in a second time slot, retransmitting the date transmitted in the first time slot in a third time slot, and transmitting, by the repeater, an overall status to the network in a last time slot after the third time slot.

Applicants' independent claim 10, as currently amended, recites a radio communication system including a first transceiver, a second transceiver, and a repeater. Upon receiving data from one of either the first or second transceivers, in a first time slot, the repeater transmits a repeat flag in a second time slot to cause the transceivers to suspend further action, then in a third time slot transmits the data received in the first

time slot, and transmits an overall status to all transceivers in a last time slot after the third time slot to cause the transceivers to resume further action.

Applicants' independent claim 16, as currently amended, recites a transceiver for use in a radio communication system including at least one other transceiver and a repeater. Upon receiving a repeat flag, in a second time slot, the transceiver suspends further action until it receives, in a third time slot, data that was originally transmitted by the at least one other transceiver in a first time slot, and an overall status from the repeater in a last time slot, after the third time slot, after which the transceiver resumes normal action.

Brederveld et al. discloses that "[t]he present invention responds by basing a decision of whether to repeat on whether the destination end-station has received the unicast message", through the use of R- and S-Bleep acknowledgement signals transmitted during the WIFS so as to conserve bandwidth. See, e.g., col. 2, lines 29-32 and 40-49 of Brederveld et al. Brederveld et al. discloses that a source end station transmits a first data frame, and then a repeater transmits a repeat flag in a wireless interframe space (i.e., the time between transmission of data frames). If the destination end station receives the first transmission, then an S-Bleep is sent by the destination end station, and not by the repeater (and no retransmission occurs). If the destination end station does not receive the transmission from the source end station, no S-Bleep is sent, and thus the repeater then retransmits the first data frame during the next frame. See, e.g., col. 7, lines 35-48 of Brederveld et al. Applicants submit that Brederveld et al. does not disclose or suggest that the repeater then retransmits an overall status for both the source and destination end stations that informs the end stations that the data has been relayed and that they may return to normal operation.

Rather, Brederveld et al. teaches that the repeater then listens for an S-Bleep from the destination end station to determine if the retransmission was successful. This S-Bleep would not be detected by the source end station. As it detects the R-Bleep from the repeater, it would not be listening for any such acknowledgement from the end station, as it only listens for an acknowledgment from the repeater in the WIFS after its transmission. The source end station does not further check that the relay was actually able to deliver the data frame, nor does the relay station attempt to inform the source station if it failed to deliver the message (e.g., if xmit count = max in step 590, there is no further step of informing the source end station).

For at least these reasons, Applicants submit that Brederveld et al. does not anticipate the inventions recited in Applicants' independent claims 1, 4, 10 and 16.

Applicants' independent claim 19 recites a method for use in a radio communications system including a first transceiver, a second transceiver and a repeater. Upon receipt of a data transmission from the first transceiver, the repeater re-transmits the data transmission from the first transceiver, and upon receipt of a data transmission from the second transceiver before the repeater completely receives or retransmits the data transmission from the first transceiver, the repeater transmits a data sequence instructing each transceiver to cease its respective transmission.

Applicants' independent claim 27 recites a radio communications system including a first transceiver, a second transceiver and a repeater. Upon receipt of a data transmission from the first transceiver, the repeater re-transmits the data transmission from the first transceiver, and upon receipt of a data transmission from the second transceiver before the repeater completely receives or retransmits the data transmission

from the first transceiver, the repeater transmits a data sequence instructing each transceiver to cease its respective transmission.

Applicants' independent claim 35 recites a repeater for use in a radio communications system including at least a first transceiver and a second transceiver. Upon receipt of a data transmission from the first transceiver, the repeater re-transmits the data transmission from the first transceiver, and upon receipt of a data transmission from the second transceiver before the repeater completely receives or retransmits the data transmission from the first transceiver, the repeater transmits a data sequence instructing each transceiver to cease its respective transmission.

Applicants' independent claim 37 recites a transceiver for use in a radio communications system including at least one other transceiver and a repeater. Upon receipt of a data transmission from the at least one other transceiver, the repeater re-transmits the data transmission from the at least one other transceiver, and upon receipt of a data transmission from the transceiver before retransmitting the data transmission from the at least one other transceiver, the repeater transmits a data sequence instructing each transceiver to cease respective transmissions. Upon receipt of the data sequence from the repeater, the transceiver will cease transmission.

In the Office Action, the Examiner notes that Brederveld et al. teaches a relay R-Bleep signal by the repeater station before retransmitting data from the source end station (col. 5, lines 54-56 and col. 6, lines 10-13), and notes that if the R-Bleep signal is received by *the source end station*, then the source end station will cease its respective transmission (col. 5, lines 61-63). Applicants respectfully traverse the rejections for at least the following reasons.

First, Brederveld's R-Bleep signal may only be sent during the wireless interframe space (WIFS), which by definition, occurs *after* the source end station has already ceased its transmission. Further, col. 5, lines 61-63 of Brederveld et al. only teach that if an R-Bleep or S-Bleep is received by the source end station, then the source end station will not *reschedule* the message for retransmission. This passage does not teach that the source end station will interpret an R-Bleep as an instruction to cease an *active* transmission, for at least the reason that there is not an active transmission to cease at the time of the R-Bleep (based on the definition of the WIFS). Rather, it interprets an R-Bleep or S-Bleep as an acknowledgment that the message was successfully received by a station capable of passing it on.

If the Examiner takes the position that an R-Bleep can be sent while the source end station is transmitting, i.e., not during the WIFS, then Applicants submit that the rejections of claims 1, 10, 14 and 16 must be withdrawn, since the R-Bleep is then not transmitted during a slot between transmission by the first station and retransmission by the repeater, as the Examiner asserts.

Further, Applicants' claims require that transmission by the repeater occurs only in the event of receipt of a data transmission from the *second transceiver*, which is the destination end station. There is not discussion of such triggering event by Brederveld et al., nor is there any discussion about the possibility of a collision due to two stations having overlapping transmissions.

Specifically, Brederveld et al. does not discuss what happens in the case of a collision occurring at a repeater – that is, the second station starts transmitting either during the first data transmission or before the relay retransmits the first data transmission. However, it is submitted that Brederveld et al. teaches that the repeater will

transmit an R-Bleep in the WIFS after reception of a data transmission, and that it is only the transmitting station that is actively listening for this R-Bleep. If both the source and destination stations receive an R-Bleep, they would not both interpret this R-Bleep as an indication to cease transmission, as it is only the recently transmitting station that is listening for the R-Bleep. The second station is unaware of the first transmission (and so begins to transmit or is planning to begin transmission), and thus, it would either not be listening for an R-Bleep associated with the first transmission, or would ignore any R-Bleep as it is not relevant to its current transmission. Accordingly, it would not interpret this R-Bleep as an instruction to cease transmission. Instead, it would wait unit the end of its transmission and then start listening for another R-Bleep and/or S-Bleep in the associated WIFS.

Applicants further submit that in the case that both the source (first) and destination (second) stations are in range of each other, then Brederveld et al. does not teach that the relay transmits a data sequence to cause *both* stations to cease transmission in the event of a collision.

It is not clear from Brederveld et al. what would happen in the event that the source and destination are in range and the destination does not sense transmission by the source and starts its own transmission. It is likely that a repeater will receive both transmissions, but will either refrain from transmitting an R-Bleep (due to an inability to successfully decode the messages), or will transmit two separate R-Bleeps, one for each transmitter. There is no suggestion of the repeater transmitting a data sequence instructing each transceiver to cease its respective transmission.

However, if the destination station avoids transmitting during transmission by the source station, then Brederveld et al. teaches that the relay sends an R-Bleep in the WIFS

and that the destination station respects the WIFS (i.e., does not attempt transmission of its data message) and instead transmits an S-Bleep acknowledgment message. First, it is submitted that this S-Bleep transmission is an acknowledgment message and not a data transmission (if it was it would be a violation of the WIFS). However, if it is argued that the S-Bleep was the "data transmission from the second transceiver before the repeater... retransmits the data transmission from the first transceiver", then Applicants submit that Brederveld et al. does not teach that the relay sends the required data sequence to cause *both* stations to cease transmission. Rather, Brederveld et al. teaches away from the claimed subject matter, as it teaches that the S-Bleep follows the R-Bleep and that the relays only repeat messages where no S-Bleep signal is detected in order to save bandwidth. See, e.g., col. 5, line 65 – col. 6, line 5 of Brederveld et al. The destination end station could then send its transmission at the end of the WIFS (i.e., it hasn't ceased its own data transmission after the R-Bleep from the repeater. Also, there would be no further transmission by the relay of a data sequence to cause *both* transceivers to cease transmission. Rather, it would wait for the end of the transmission by the destination end station, and then send a second R-Bleep for the destination end station's data transmission.

Applicants submit that even if one adapted Brederveld et al. to reverse the order of the R-Bleep and the S-Bleep (which is not suggested by Brederveld et al.), then the R-Bleep cannot be considered a data sequence causing *both* transceivers to cease transmission, as in this case, both the source and destination end stations have already ceased transmission. Rather, transmission of both the R-Bleep and the S-Bleep acknowledgment signals in the WIFS is used to inform the relay and transceivers that

retransmission is not required in this case. The destination station would then proceed to send its data transmission (i.e., it has not ceased transmission).

In summary, Brederveld et al. is focused on saving bandwidth by "basing a decision of whether to repeat [a message] on whether the destination end station has received the unicast message". See col. 2, lines 30-33 of Brederveld et al. The system of Brederveld et al. relies on existence of a defined wireless interframe space (WIFS) that immediately follows any data transmission (and that is not to be used for data transmission). Brederveld et al. teaches use of the WIFS for sending/receiving R-Bleep or S-Bleep acknowledgment messages. Further, the R-Bleep signal sent by the repeater is only intended for use by the previously transmitted station as a signal of successful transmission and reception, and other stations will not interpret this transmission as an instruction to cease transmission.

In contrast, the disclosed invention is concerned with an improved communication system which specifically considers the case of a collision due to a data transmission from the second transceiver before the repeater completely receives or re-transmits the data transmission from the first transceiver. A data sequence is transmitted to cause both transceivers to cease transmission, thus informing them of a collision state at a relay or intermediate station (allowing the stations to both back off and retry).

For at least these reasons, Applicants submit that Brederveld et al. does not anticipate the inventions recited in Applicants' independent claims 19, 27, 35 and 37, and request that the Examiner withdraw the rejections under 35 U.S.C. §102(b).

In the Final Office Action, the Examiner rejects claims 6-9, 12, 13 and 19 under 35 U.S.C. §103(a) as being unpatentable over Brederveld et al. in view of Fuji et al. (U.S. Patent Application Publication No. 2002/0106011) and Hwang et al. (U.S. Patent

Application Publication No. 2003/0108013); rejects claims 20, 21, 28, 29, 36 and 38 under 35 U.S.C. §103(a) as being unpatentable over Brederveld et al. in view of Stutz (U.S. Patent Application Publication No. 2002/0128996); and rejects claims 22-26, 30-35 and 39-43 under 35 U.S.C. §103(a) as being unpatentable over Brederveld et al. in view of Stutz and Soh et al. (U.S. Patent No. 6,539,028). Applicants submit that Fuji et al., Hwang et al., Stutz and Soh et al. fail to overcome the above-noted deficiencies of Brederveld et al. with respect to the independent claims. Accordingly, Applicants request that that the Examiner withdraw the rejections under 35 U.S.C. §103(a).

Based on the above, it is respectfully submitted that this application is in condition for allowance, and a Notice of Allowance is respectfully requested.

SUMMARY AND CONCLUSION

Reconsideration of the outstanding Office Action, and allowance of the present application and all of the claims therein are respectfully requested and believed to be appropriate. Applicants have made a sincere effort to place the present invention in condition for allowance and believe that they have done so.

Any amendments to the claims which have been made in this amendment, and which have not been specifically noted to overcome a rejection based upon the prior art, should be considered to have been made for a purpose unrelated to patentability, and no estoppel should be deemed to attach thereto.

Should an extension of time be necessary to maintain the pendency of this application, including any extensions of time required to place the application in condition for allowance by an Examiner's Amendment, the Commissioner is hereby authorized to charge any additional fee to Deposit Account No. 19-0089.

Should the Examiner have any questions or comments regarding this response, or the present application, the Examiner is invited to contact the undersigned at the below-listed telephone number.

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